G. William Chapman IV

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SUMMARY

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EDUCATION

- **Boston University** — Boston, MA
  Doctor of Philosophy - Computational Neuroscience — *December 2022 (expected)*

- **University of Colorado** — Boulder, CO
  Master of Arts - Cognitive Psychology — *2018*

- **Boston University** — Boston, MA
  Bachelor of Science - Biomedical Engineering — *2012*

SKILLS

- **Languages**: Python, MATLAB, R, Bash, SQL, LaTeX
- **Frameworks**: Scikit Learn, PyTorch, Pandas, Numpy
- **Other**: Machine Learning, Time Series, Advanced Statistical Analysis, Dynamical Systems, Biomedical Engineering

EXPERIENCE

- **eCortex** — Boulder, CO
  Neural Modeler — *Nov 2016 - August 2018*

- **Center for Systems Neuroscience** — Boston, MA
  Research Software Engineer — *May 2012 - August 2016*
  - **Discussion Forum Upgrades**: Refactor forum for performance to handle large databases.
  - **REST API for Discussion Forum**: Symphony & Twig based Forum parts converted to API-first interface.
  - **Ratchet PHP WebSocket**: Implemented a WebSocket for low-latency real time exchange of posts and thread updates.

- **Boston Medical Center** — Boston, MA
  Neuroimaging Research Assistant — *May 2009 - May 2012*
  - **Project Course - Find Movie Similarity from Plot Summaries**: Created project based course using Unsupervised learning and natural language processing.
  - **Tutorial - Introduction to Reinforcement Learning**: Created tutorial for Q-learning RL algorithm and concepts.
  - **Impact**: Course has been taken by 250+ students so far with 4.65 average rating.

PROJECTS

- **Vison - multimedia search engine (NLP, Search Engine, Web Crawlers, Multimedia Processing)**: (Work in progress) Research oriented, open source, search engine for bringing reverse multimedia search to small & mid scale enterprises. Tech: Python, NodeJS, Intel OpenVino Toolkit, Selenium, TensorFlow (October '18)

- **Reinforcement Learning based Traffic Control System (Reinforcement Learning, Computer Vision)**: AI model to resolve city traffic around 50% faster. Tech: Python, Alibaba Cloud, Raspberry Pi, Arduino, SUMO & OpenCV. (August '18)

- **Panorama from Satellite Imagery using Distributed Computing (Distributed Computing, Image Processing)**: Images clicked using drones, provided by ISRO were stitched together using distributed public compute nodes, effectively bringing down processing time exponentially. Tech: PHP, C++, Java, Python (March '18)

- **Drag-n-drop machine learning learning environment (Web Development, Machine Learning)**: Scratch like tool for implementing machine learning pipelines along with built in tutorial for each concept. Tech: Python, JavaScript (September '18)

- **Search Engine and Social Network(Web Development, Web Crawler, Search)**: Created from scratch a social network and a search engine based on the idea of integrating Facebook and Google. The launched website was among top 1000 websites in India during 2012-2013. Tech: PHP, MySQL, HTML, CSS, WebSockets, JavaScript, RSS, XML (May '12)

Publications

1. A. S. Alexander, J. C. Tung, G. W. Chapman, A. M. Conner, L. E. Shelley, M. E. Hasselmo, and D. A. Nitz, "Adaptive integration of self-motion and goals in posterior parietal cortex," *Cell Reports*, vol. 38, p. 110504, Mar. 2022

2. L. C. Carstensen, A. S. Alexander, G. W. Chapman, A. J. Lee, and M. E. Hasselmo, "Neural responses in retrosplenial cortex associated with environmental alterations," *iScience*, vol. 24, p. 103377, Nov. 2021

3. M. E. Hasselmo, A. S. Alexander, A. Hoyland, J. C. Robinson, M. J. Bezaire, G. W. Chapman, A. Saudargiene, L. C. Carstensen, and H. Dannenberg, "The unexplored territory of neural models: Potential guides for exploring the function of metabotropic neuromodulation," *Neuroscience*, p. S0306452220302141, Apr. 2020

4. A. S. Alexander, J. C. Robinson, H. Dannenberg, N. R. Kinsky, S. J. Levy, W. Mau, G. W. Chapman, D. W. Sullivan, and M. E. Hasselmo, "Neurophysiological coding of space and time in the hippocampus, entorhinal cortex, and retrosplenial cortex," *Brain and Neuroscience Advances*, vol. 4, p. 239821282097287, Jan. 2020

5. A. S. Alexander, L. C. Carstensen, J. R. Hinman, F. Raudies, G. W. Chapman, and M. E. Hasselmo, "Egocentric boundary vector tuning of the retrosplenial cortex," *Science Advances*, July 2019

6. J. R. Hinman, G. W. Chapman, and M. E. Hasselmo, "Neuronal representation of environmental boundaries in egocentric coordinates," *Nature Communications*, vol. 10, p. 2772, Dec. 2019

7. C. K. Monaghan, G. W. Chapman, and M. E. Hasselmo, "Systemic administration of two different anxiolytic drugs decreases local field potential theta frequency in the medial entorhinal cortex without affecting grid cell firing fields," *Neuroscience*, vol. 364, pp. 60–70, 2017

8. J. R. Hinman, M. P. Brandon, J. R. Climer, G. W. Chapman, and M. E. Hasselmo, "Multiple Running Speed Signals in Medial Entorhinal Cortex," *Neuron*, vol. 91, no. 3, pp. 666–679, 2016

9. M. Ferrante, C. F. Shay, Y. Tsuno, G. W. Chapman, and M. E. Hasselmo, "Post-Inhibitory Rebound Spikes in Rat Medial Entorhinal Layer II/III Principal Cells: In-Vivo, In-Vitro, and Computational Modeling Characterization," *Cerebral Cortex*, no. March, 2016

10. Y. Tsuno, G. W. Chapman, and M. E. Hasselmo, "Rebound spiking properties of mouse medial entorhinal cortex neurons in vivo.," *The European journal of neuroscience*, vol. 42, pp. 2974–2984, Jan. 2015

11. C. F. Shay, M. Ferrante, G. W. Chapman, and M. E. Hasselmo, "Rebound spiking in layer II medial entorhinal cortex stellate cells: Possible mechanism of grid cell function," *Neurobiology of Learning and Memory*, 2015

12. F. Raudies, M. P. Brandon, G. W. Chapman, and M. E. Hasselmo, "Head direction is coded more strongly than movement direction in a population of entorhinal neurons," *Brain Research*, vol. 1621, pp. 355–367, Sept. 2015

13. A. L. Jefferson, K. A. Gifford, S. Damon, G. W. Chapman, D. Liu, J. Sparling, V. Dobromyslin, and D. Salat, "Gray & white matter tissue contrast differentiates Mild Cognitive Impairment converters from non-converters," *Brain Imaging and Behavior*, vol. 9, pp. 141–148, June 2015

14. K. a. Gifford, D. Liu, S. M. Damon, G. W. Chapman, R. R. Romano, L. R. Samuels, Z. Lu, and A. L. Jefferson, "Subjective Memory Complaint Only Relates to Verbal Episodic Memory Performance in Mild Cognitive Impairment," *Journal of Alzheimer's Disease*, vol. 44, pp. 309–318, Jan. 2015

Honors and Awards

- Awarded title of Intel Software Innovator - May, 2019
- Second Runner's Up at TCS EngiNx Engineering Project Innovation Content - September, 2018
- Runner's Up at Facebook Developers Circle Hackathon - August, 2017

Professional Service

- **Invited reviewer**: Neural Networks (2018-present); Neural Information Processing Systems (NeurIPS) (2019-present); International Conference on Learning Representations (ICLR) (2020-present)

- **Academic Planning Committee**: Graduate Student representative on a small panel of faculty responsible for overseeing and approving changes in undergraduate and graduate degree program requirements. 2018 - 2019.